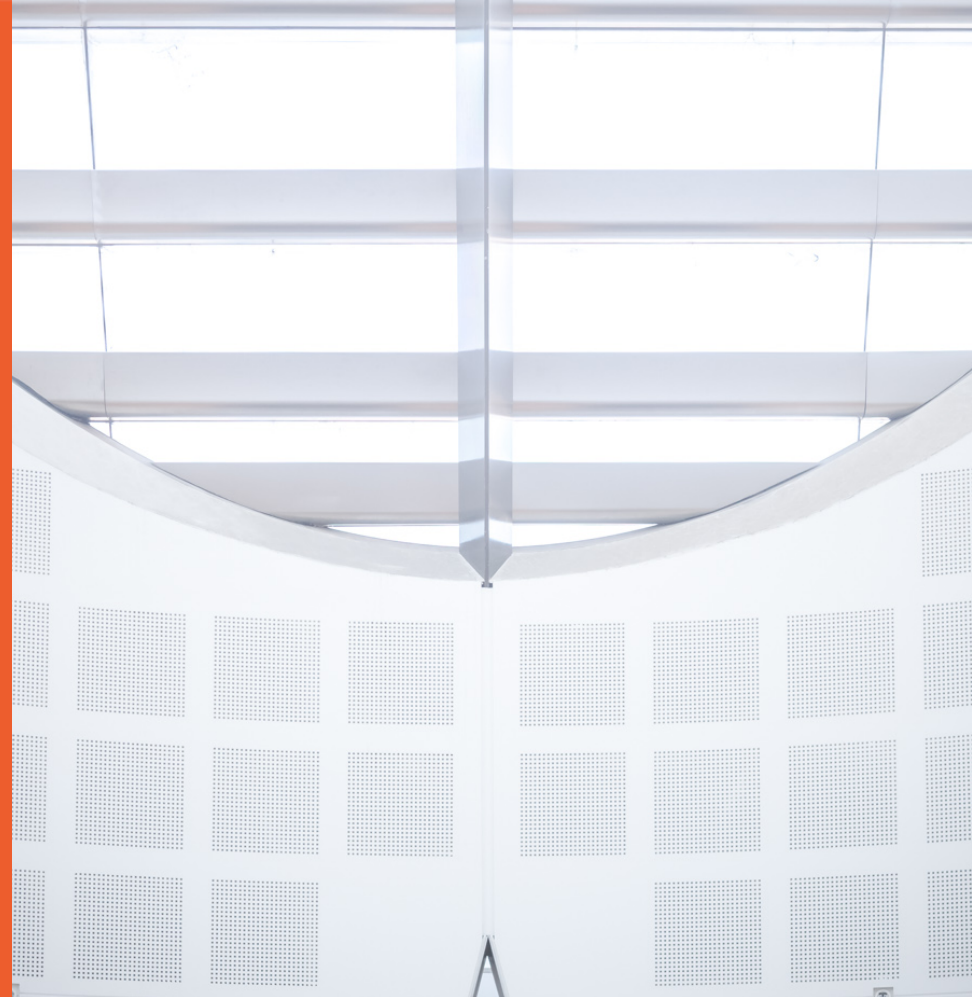


**Key principles for a  
successful digital  
pedagogy for  
academic literacy:  
lessons from the  
evolution of online  
programs for science and  
engineering genres**

**Presented by**  
Helen Drury  
Learning Centre



THE UNIVERSITY OF  
**SYDNEY**

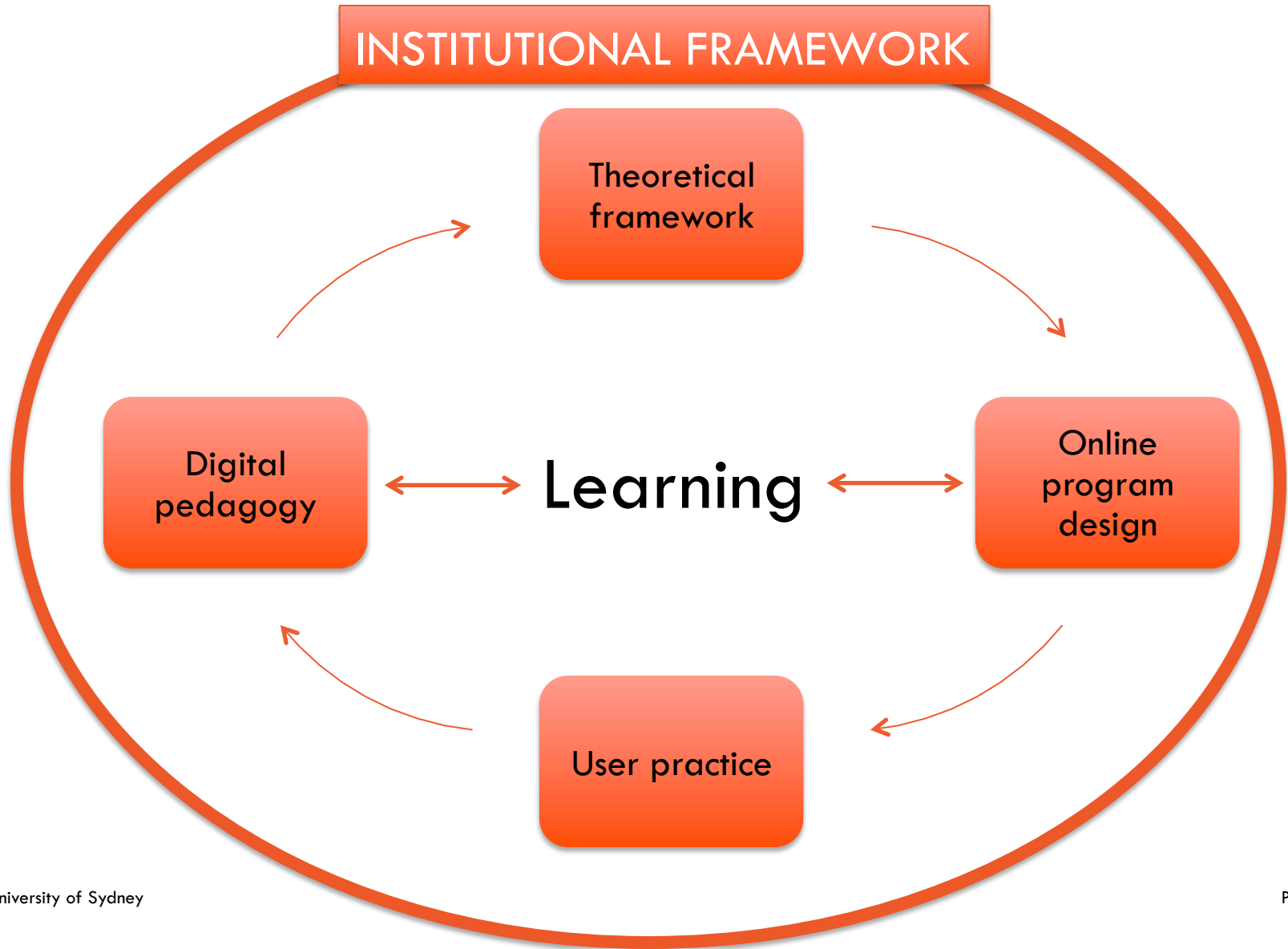


**AALL 2015 UOW  
CONFERENCE**

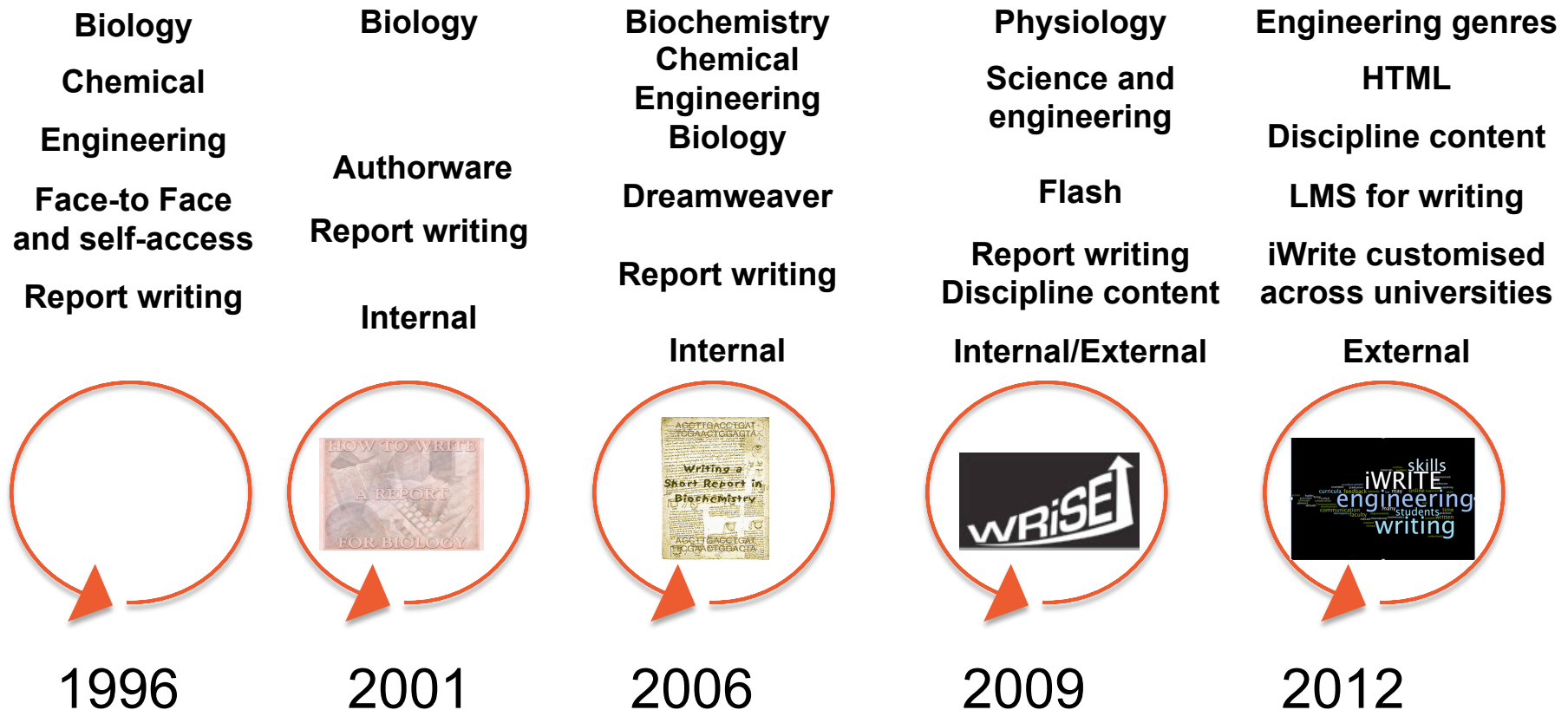
CRITICAL INTERSECTIONS: THE 12TH BIENNIAL CONFERENCE OF THE  
ASSOCIATION FOR ACADEMIC LANGUAGE AND LEARNING

**University of Wollongong**  
**25-27th November 2015**

# Overview: the critical intersections

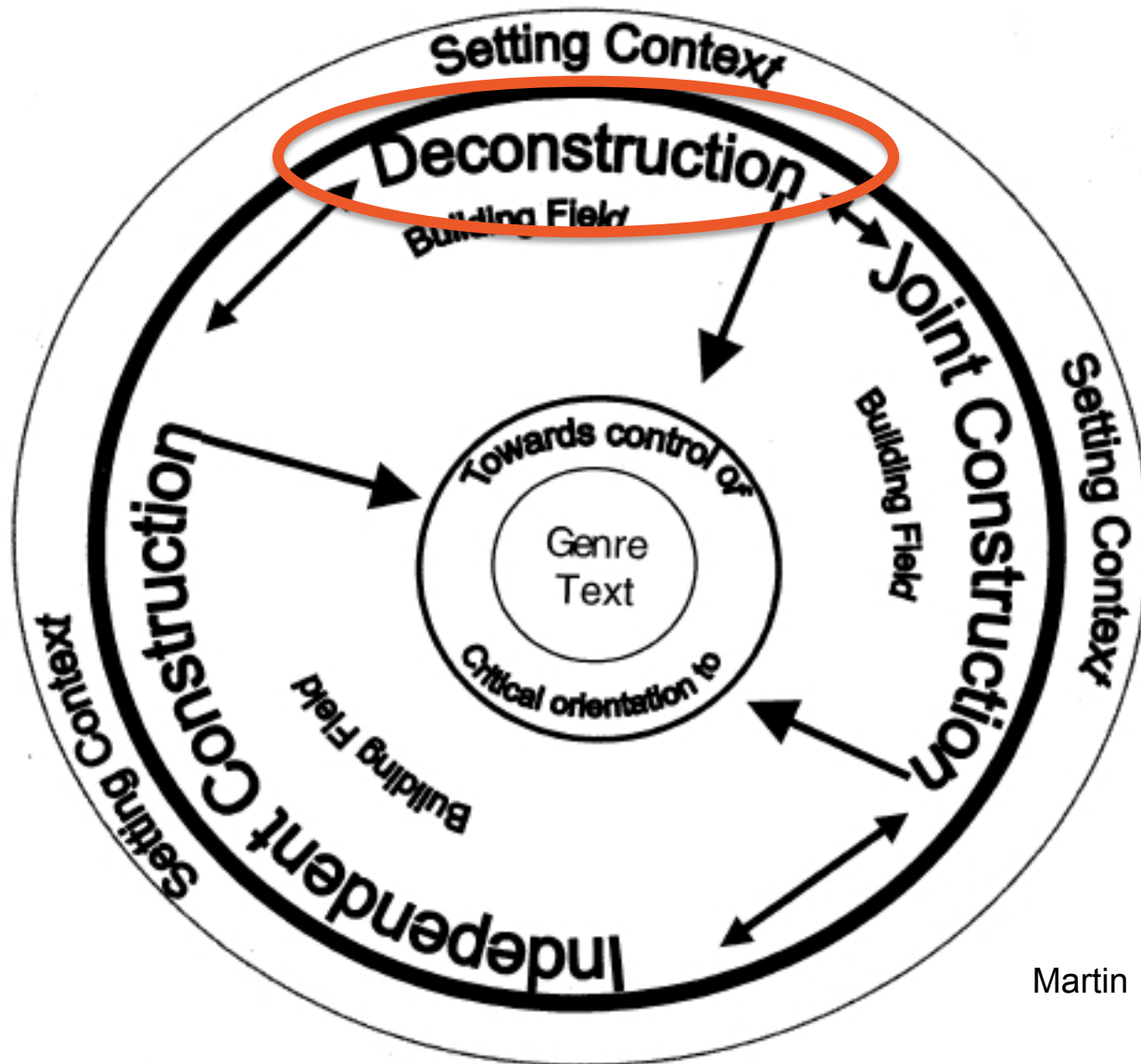


# Evolution of report writing programs



‘design takes the results of past production as the resource for new shaping and for remaking’ (Kress 2000 p.156)

# Genre based literacy pedagogy in the SFL tradition



Martin 1999 p.131

# Moving online: theoretical frameworks

## Social semiotic theory of communication

### Four rhetorical/semiotic principles to provide a theoretical framework for design processes:

- selection of the meaning making materials or modes,
- their arrangement,
- their foregrounding and
- the social relations they create.

(Bezemer & Kress 2008)

‘representational and communicational resources are central to the shaping of knowledge and that contributes to the environment in which learning is brought about’ (Jewitt 2006 p.162)

# Moving online: theoretical frameworks

## Cognitive psychology

### Cognitive theory of multimedia learning

- limited capacity for processing: cognitive load theory
- dual channels for the processing of visual and verbal material
- active processing: deep learning depends on the learners' cognitive processing during learning

### Evidence-based design principles

- reduce extraneous processing, e.g. reduce extraneous material and highlight essential material, place printed text next to corresponding graphics
- manage essential processing, e.g. present material in learner paced segments, provide overview of key components (pretraining), modality principle (don't overload one channel)
- foster generative processing e.g. present words and pictures rather than words alone, present words in conversational style



# Evolution of online program design: towards a visual mode

## Writing a report in Biology: Stages in the structure of sections of a lab report

Introduction Page 1/3

Structure

**B : THE STRUCTURE**

The four different types of information typically found in the introduction are usually structured in a particular way:

<b>Stage 1</b>	State the subject of the report and why it is important
<b>Stage 2</b>	Summarise what researchers already know about the subject
<b>Stage 3</b>	State how your experiment compares with previous experiments
<b>Stage 4</b>	State the aim and/or hypothesis of your experiment

Arrangement: layout and framing: centre screen, rectangular framing  
Colour: foregrounding: bold red for each stage, orange framing, overall colour choices confusing

# Evolution of online program design: towards a visual mode

## Writing a Short Report in Biochemistry

- Overview
- Title
- Introduction
- Methods
- Results
- The Discussion
  - Background
  - Content
  - Structure
  - Language
    - Cohesion
    - Tense
    - Certainty & Usuality

### DISCUSSION: Structure

The staging of the discussion is not always straightforward and the order in which you sequence the information depends on the aim of the experiment and the kind of results you obtained. Your discussion is an argument about how you see your results. Use the questions in the Content section and the stages mentioned here to help you to develop your argument in a logical way. Remember that not all of the questions or the stages will be relevant to every experiment.

One guideline for staging the discussion is shown here based on extracts from the discussion in one of the cholesterol reports. Although this is a good guideline, remember it is only a guideline and you need to adapt it to each experiment you carry out.

Click on the stages to see an example.



**Stage 1** : Relate your results to the aims of the experiment

**Stage 2** : Summarise your results (can combine with Stage 1).

**Stage 3** : Explain your results. Discuss the validity and accuracy of your results. Explain inconsistent or unexpected results.

**Stage 4** : Identify problems in experimental technique and suggest improvements (can combine with Stage 3).

**Stage 5** : State the significance or implications of your experimental findings and areas of future research.

[Previous](#)   [Exercise](#)

Consumption of a high cholesterol diet did not significantly increase blood cholesterol concentration over a 12 week period (Figure 1) Similarly, over the same period, consumption of a low cholesterol diet did not significantly reduce plasma cholesterol concentration.

Arrangement: layout and framing: stages in centre screen, explanation and instruction block text above, frame below for revealing example of each stage  
Colour: foregrounding: use of orange background for stages, contrast to yellow, stages in bold black and functions in red, choices of colour linked to banner



# Evolution of online program design: towards a visual mode



- Structuring the Discussion
- Scientific language
  - Using verbs
  - Developing an argument

## Structure

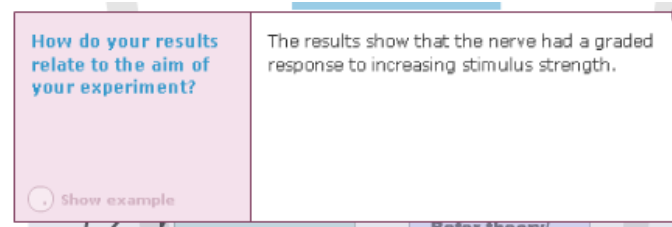
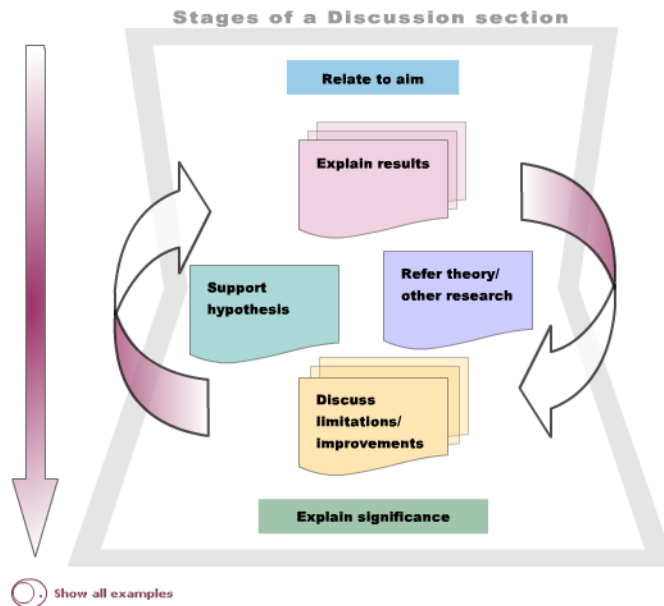


Here is a diagram of the typical stages of a Discussion section. Some stages are more complex than others and build up in layers, each time something is elaborated, e.g. you may explain one result then have to say whether it was expected or not and then how it related to a table or figure.

Note also that the middle section of the Discussion does not follow a strict linear order and that some stages may be repeated depending on the number of results you have to report.

When you have played the animation, click on the stages in the diagram to see which questions are answered in each stage and an example of that stage. The examples are from a student's Discussion on 'The effect of Increasing the Strength of an Electrical Stimulus on the Electrical Response of a Sciatic Nerve of a Queensland Cane Toad'.

Note the movement from general to specific and back to general.



Arrangement: layout and framing: 'hour glass' frame illustrates movement from general to particular and back to general. Stages grouped in frame within semi-rectangles, no longer strictly linear  
Colour: identifies stages

## User practice

- Students create their own learning pathway, their own personalised curriculum (Kress 2003)
- ‘learning [is] the individual’s agentive selection from, engagement with and transformation of the world according to their principles’ (Kress 2007 p. 37)
- Reading pathway ‘guiding principle is that of following relevance according to the principles of relevance which belong to the reader—and perhaps are already shared by his [her] community’ (Kress 2003 p. 162)
- There is a range of possible reading paths (Kress 2003 p. 162)
- ‘To impose the order on that which must be read, arising out of my interest, knowledge is shaped by the reader in the act of determining/constructing/imposing such order by the reader’ (Kress 2003 p.172)

## User practice: learning from design

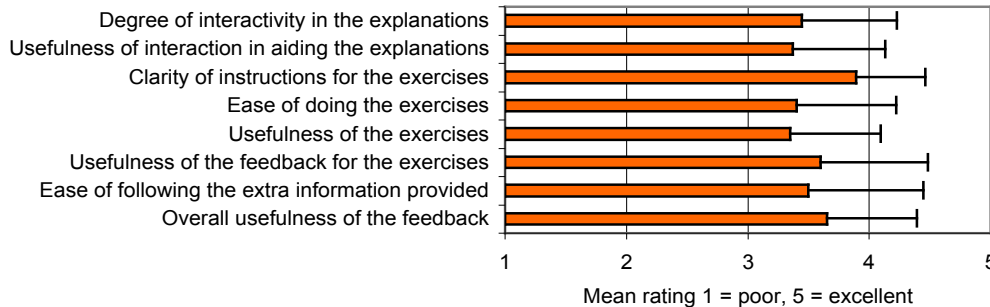
### Writing a report in biology:

- 80% of users (n=40) rated the program highly for user friendliness, navigation, clarity of instructions and explanations and usefulness of exercises and feedback
- No significant difference in performance for user group versus control who used paper-based resources (but no practice exercises)
- But significant positive correlation for user group between literacy mark and biology mark
- 66% of users more aware of problem areas and knowledge about writing reports but only 33% more confident in writing reports

# User practice: learning from design

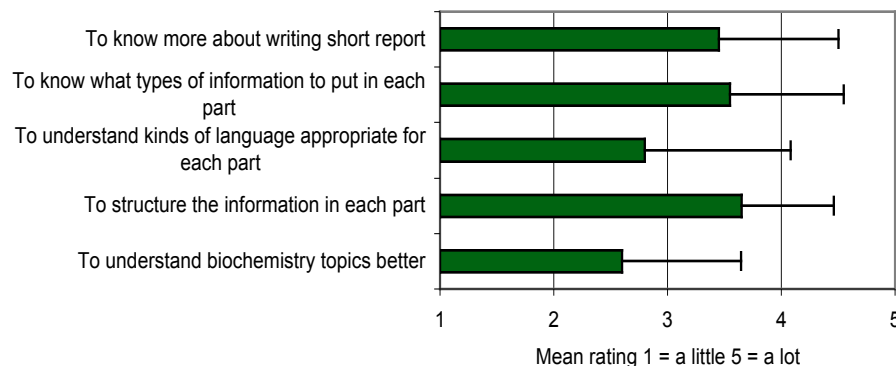
## Writing a short report in biochemistry:

**Figure 1: Mean ratings for questionnaire items relating to the explanations, exercises, and feedback given on exercises (error bars show sample standard deviation).**



- The average results of the post- test were slightly higher than those on the pre-test but these results were not statistically significant
- Users had a slightly higher report mark than non-users
- Ease of reading and understanding program content and increased confidence in report writing after using the program predict higher performance

**Figure 2 : Mean ratings for questionnaire items relating to what the program helped students learn more about (error bars show sample standard deviation).**

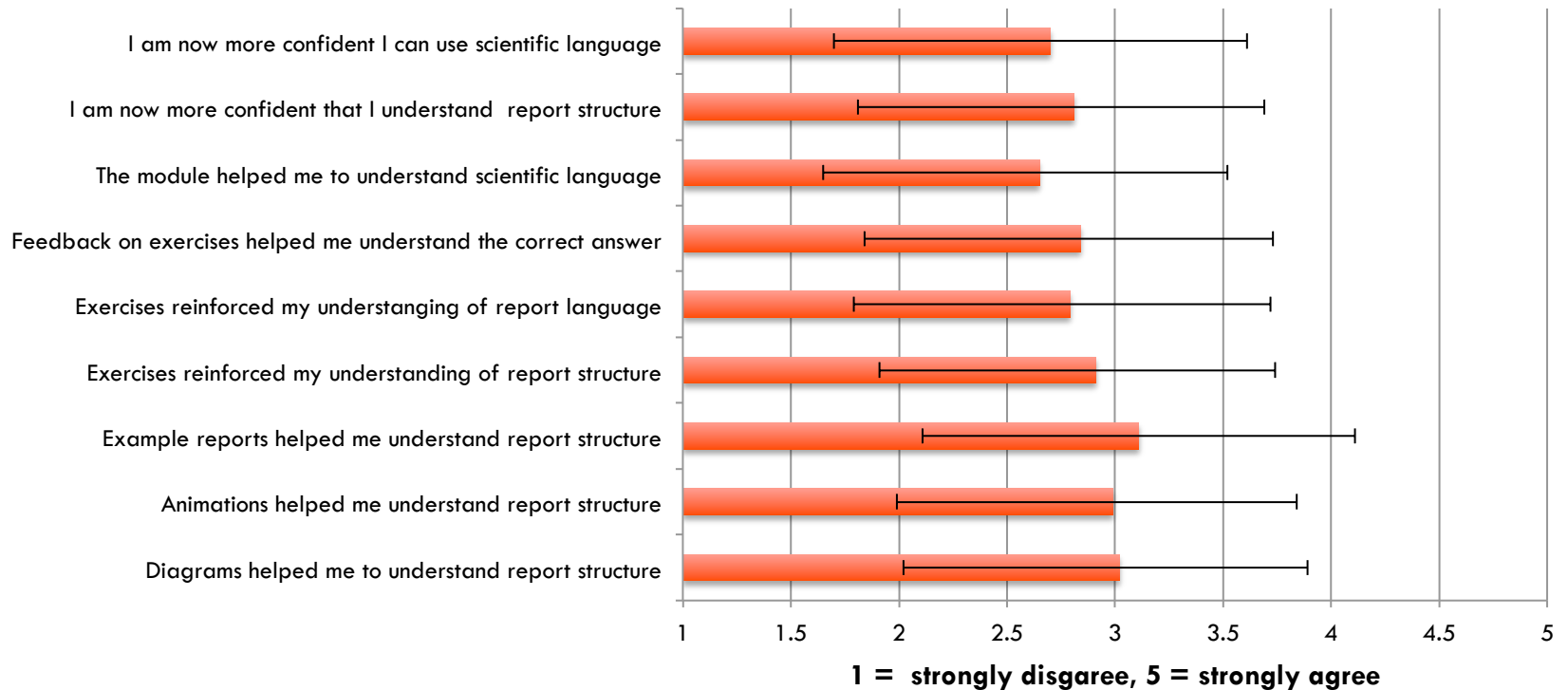


- *'I think this is a great concept and if students use it, it can really help to improve their report writing'*
- *'I feel more confident I know exactly what I should put in'*
- *'It was hard to find information on legends search function would help'*
- *'A lot of relevant, useful and important information is buried in examples and feedback – so it's hard to find'* [lecturer comment]
- *'A printable summary of the most important points would be useful'*

# User practice: learning from design

## Writing a report in Physiology:

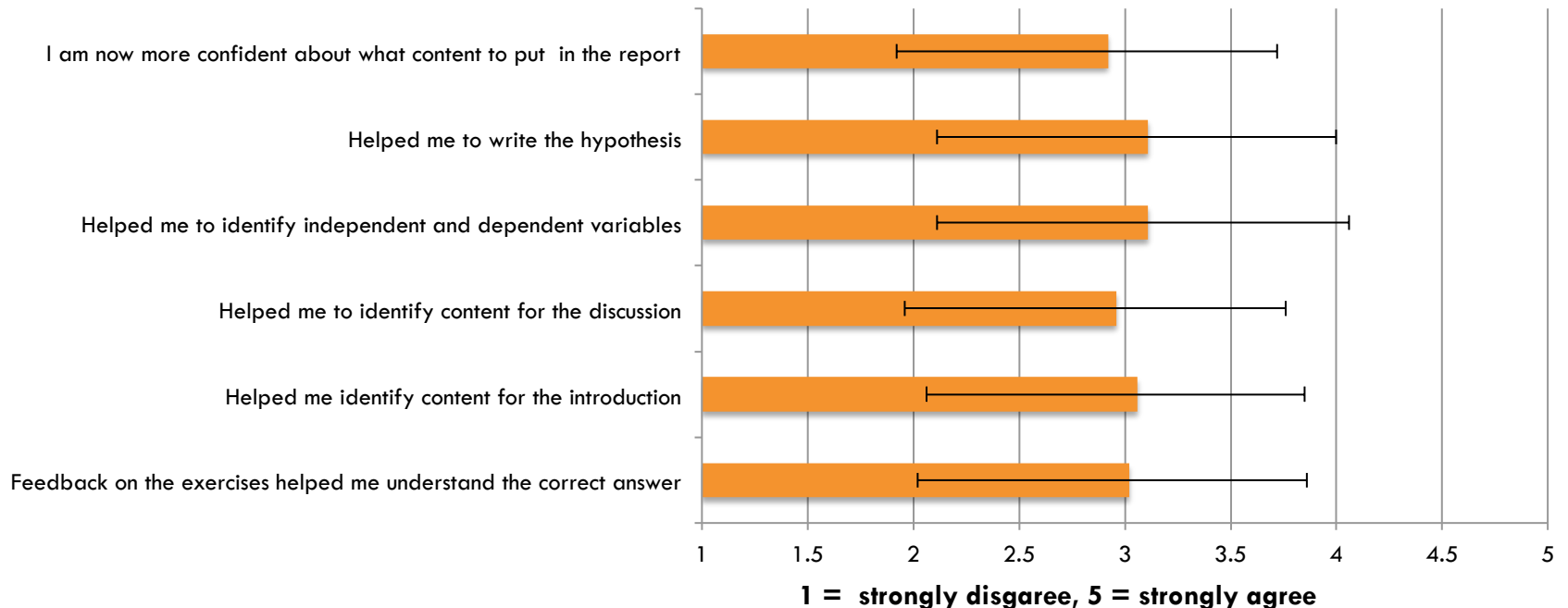
### Student perceptions of learning from Help with report writing module (n = 70)



# User practice: learning from design

## Writing a report in Physiology:

### Student perceptions of Learning from Understanding content module (n = 70)

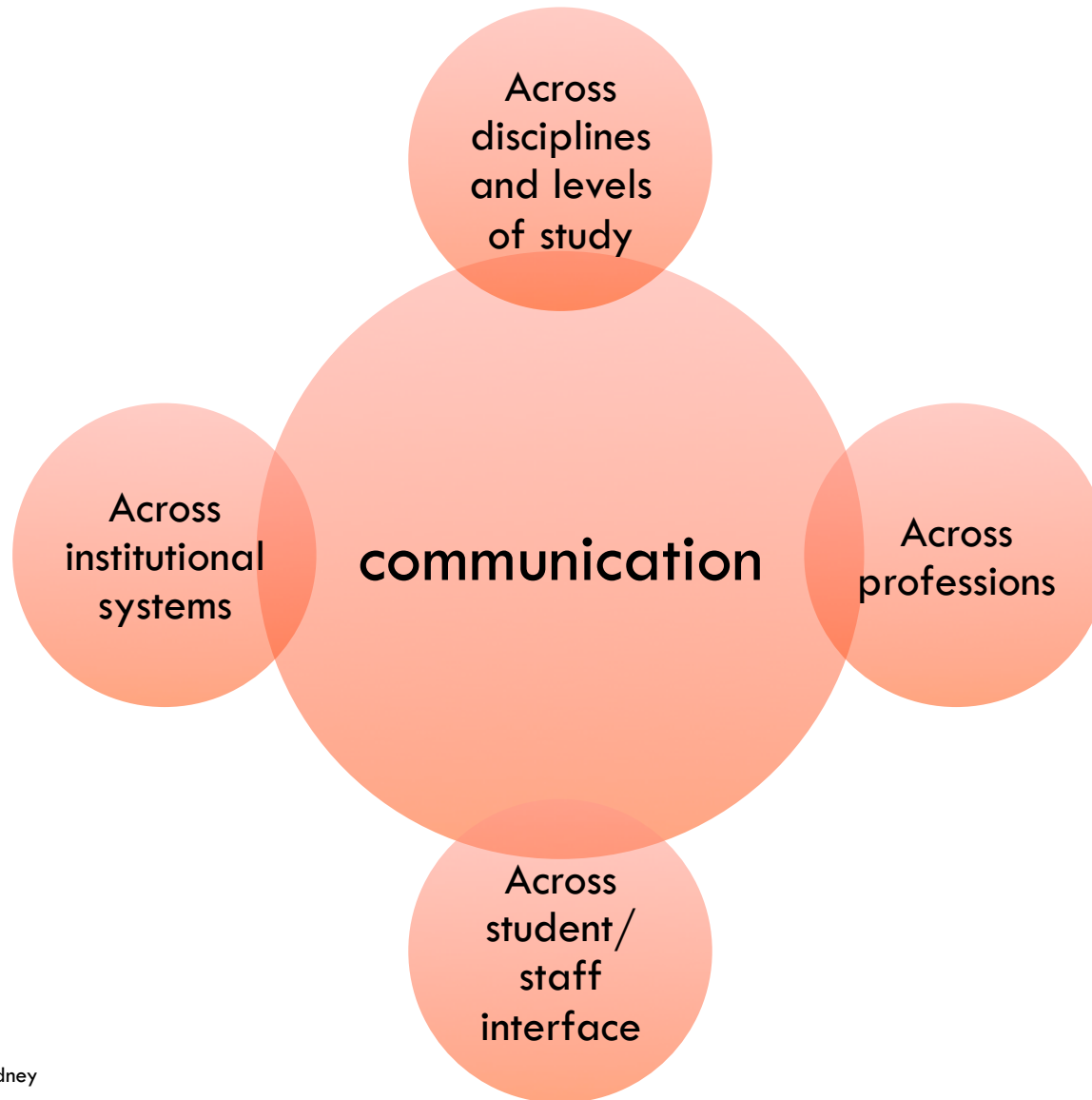




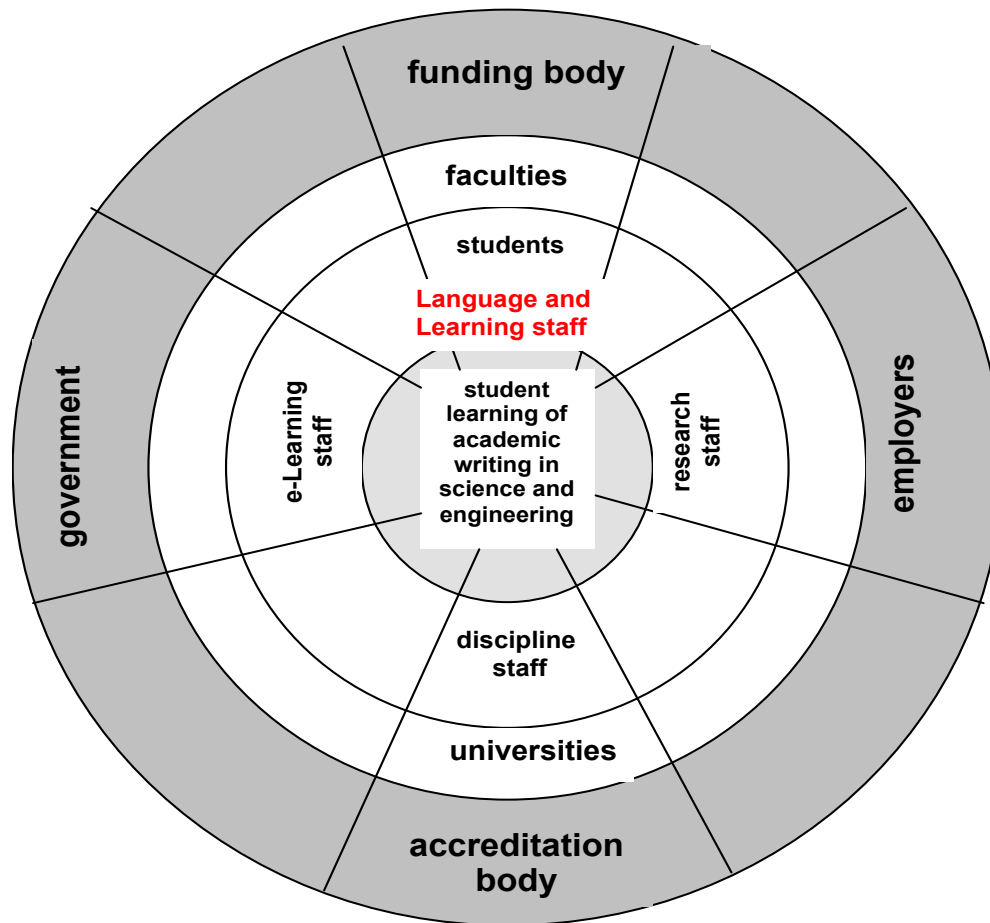
## User practice: learning from design

- *‘those examples or the example and then the structure next to it, I think was great’*
- *‘it had a sample introduction and then it highlighted each component of each part of the introduction that you needed, which was really good’.*
- *‘example reports were the most helpful to know what to put in’*
- *‘I now understand the tense requirement for the discussion sections better but still confused’*
- *‘language is a turn-off but when you look through it’s really quite useful’*
- *‘seeing those different colours is what helped me the most and, yep, I did change it. I wrote mine and then went to this site and looked at it and then went back and changed it’*

# Creating a digital pedagogy : Working across boundaries



# The context of online pedagogy: design and development: creating a community of practice



‘Communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis’

Wenger, McDermott & Snyder 2000

# Characteristics of a community of practice

- *Domain* is the area of shared interest of the group and the reason for its existence. Team members are committed to improving students' academic writing in their discipline context and building their knowledge of this domain
- *Community* refers to the members who form the group and who are committed to building relationships so that members can learn from each other. Although members are in a relationship of equality with one another, there is the need for a facilitator/co-ordinator role.
- *Practice* describes the necessary activities that practitioners in the community engage in to develop a shared practice or knowledge base around their area of interest.

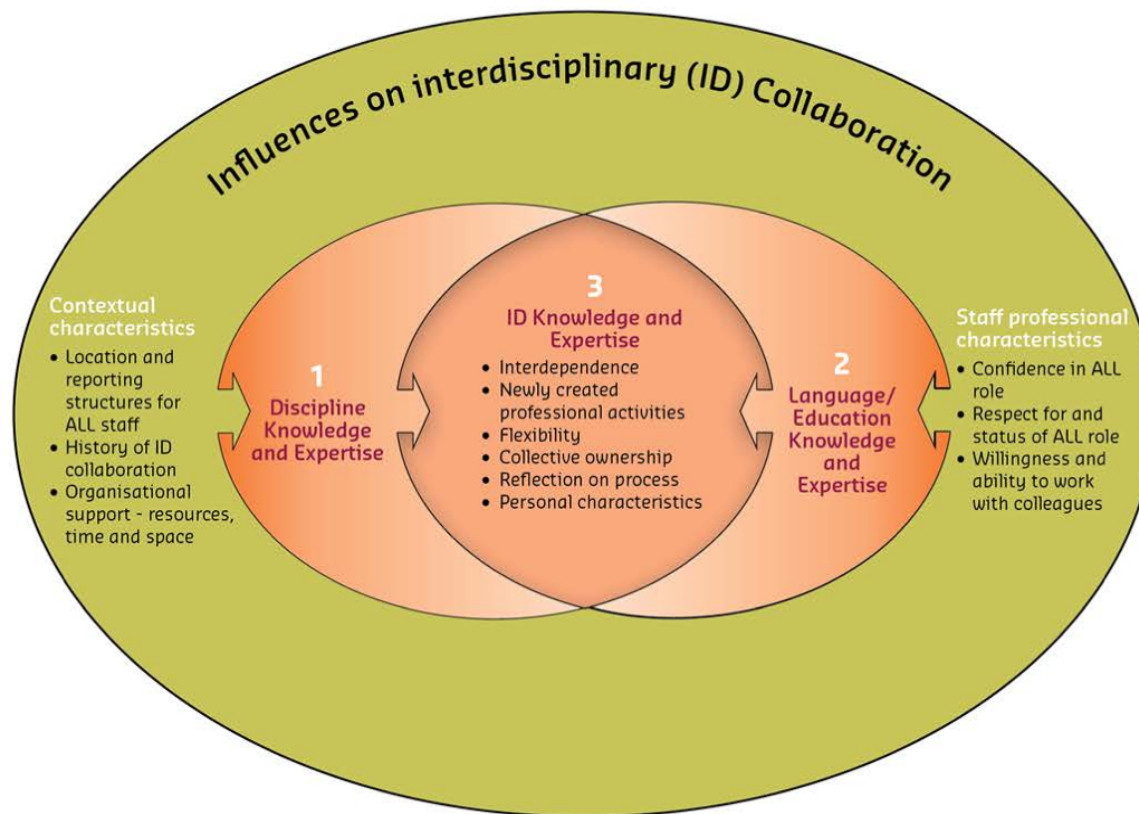
(Lave & Wenger 1991)

# Working in the third space: 'epistemic fluency' multiple ways of knowing (Goodyear and Markauskaite 2009)



## Working in the Third Space (WITTS)

A model for Interdisciplinary (ID) Collaboration to promote language development in Higher Education



C. Briguglio, 2013, adapted from L. Bronstein, 2003, A model for interdisciplinary collaboration, Social Work, 48, no.3: 297-306.  
NB: ALL = Academic Language and Learning

## The third space: ID collaboration

*one where academics from different disciplines can come together to explore teaching and learning ideas and combine knowledge and skills from their different specialisations to create new ideas, strategies and activities that would be difficult, if not impossible, for each to create in their own 'space' (p 28)*

### **Six essential elements of successful ID collaboration**

- interdependence: reliance on interaction to accomplish goals;
- newly-created professional activities: structured collaboration;
- flexibility: equality of roles and role blurring;
- collective ownership of goals: shared responsibility;
- reflection on process: working relationships;
- personal characteristics: trust, respect and understanding.

(adapted from Bronstein 2003 cited in Briguglio 2013)



# Building knowledge: Working across boundaries

Move	Text	Speech function
1	I'm just worried about the eh says here it's a good guess or prediction	statement
2	uhuh	acknowledge statement
3	but then here it's stated with certainty don't know whether that will	statement and question
4	well that means will they be able to understand that	question
5	because on the one hand it's a prediction on the other hand its	statement
6	ye	agree with statement
7	stated with certainty so I'm just wondering	statement and question
8	well we could put it is the accepted convention but they might not understand that either but that's what it is the accepted convention	statement response to question
9	do you mean do you mean that it's a statement	question/challenge
10	I mean that	statement response to question/challenge
11	formulated as a statement	clarification of question
12	it's formulated as a statement but but you don't say something like em if the stimulus is increased it is likely that	statement response to question
13	Oh ok	acknowledge statement
14	don't usually say likely	statement
15	No	acknowledge statement
16	or probably	statement
17	definite prediction	statement
18a	yes	agree with statement
18b	it may be that dddd	statement
19	your prediction is stated with some certainty	statement

The hypothesis in physiology

formulated as a statement

don't usually say likely

or probably

definite prediction

Language and literacy academics

Discipline academic

Your hypothesis is like a good guess or prediction ... However, even though your hypothesis is a good guess, it is stated as a definite prediction



Structuring the Introduction
Scientific language
Information flow
Cohesion
Linking aim to hypothesis

## Scientific language: Linking aim with hypothesis



Typically your introduction leads up to the aim and hypothesis of your experiment. Your hypothesis is like a good guess or prediction of what you expect to find from carrying out your experiment - in other words, it is like an answer to your aim. However, even though your hypothesis is a good guess, it is stated as a definite prediction e.g. 'X will' or 'will not' happen. In addition, a well developed hypothesis should begin with a short phrase which links back to the theoretical basis for the experiment.

Click on the coloured text in the Lab notes objective to see how to write an aim and hypothesis based on this objective. The colours show the connections between choices in language.

# But When institutional policies/systems are not aligned

- 2/3 of students did not use the iWrite online tutorials
- 45% said they did not know about the site, despite discipline lecturers and tutors and ALL staff reminding students of the site, providing links in units of study in LMSs and in some cases, showing the site in tutorials and lectures.

## Reasons: what students and staff say

### Curriculum alignment:

- The engineering curriculum and assessments as a whole do not address the development of writing over the undergraduate years. Writing criteria may not be included in marking rubrics, nor are marks specifically assigned to writing.
- Students adopt strategic approaches to assessments. When assignments are allocated few marks, students are not motivated to access extra learning resources.
  - *'I think it might be the weighting of the paper [why students don't use iWrite] Its only 8%... your final exam is worth 7 or 8 times that'*

## Staff motivation

Many engineering lecturers and tutors either do not know about the site and so cannot tell their students about it or they don't think it is important

- *'Get the engineering faculty to make sure it [iWrite] is always there on the LMS,  
If you want engineering students to use iWrite, it needs to be clear "hey, this will help you, here's the link now'*
- *'Lecturer xxxx doesn't stress [iWrite] at all, he may offhandedly mention it but lecturer yyyyyy is really behind it, he pushes a lot'*

## Student motivation

Students have varying motivations and goals. Some may simply want to pass a writing assignment and may not want to spend time on using the **iWrite** online tutorials even though they know using the tutorials may improve their marks.

- *‘I think most students don’t realise how important [writing] is because it’s hard. I personally tried really hard ... not for the mark ...but I want to become a good engineer and to become a good engineer you need to learn how to write reports and that’s why I tried really hard’*
- *‘I think make an assignment that forces students to use it [iWrite] and make it one of the early first or second year subjects ... an assignment where they have to go there [iWrite], get some information, write like a little report, so you can’t make an excuse that you’ve never seen it’*

# So are we serious about communication? We are but what about our institutions?

Table 2: Most important selection criteria when recruiting graduates, 2014<sup>7</sup> (%)

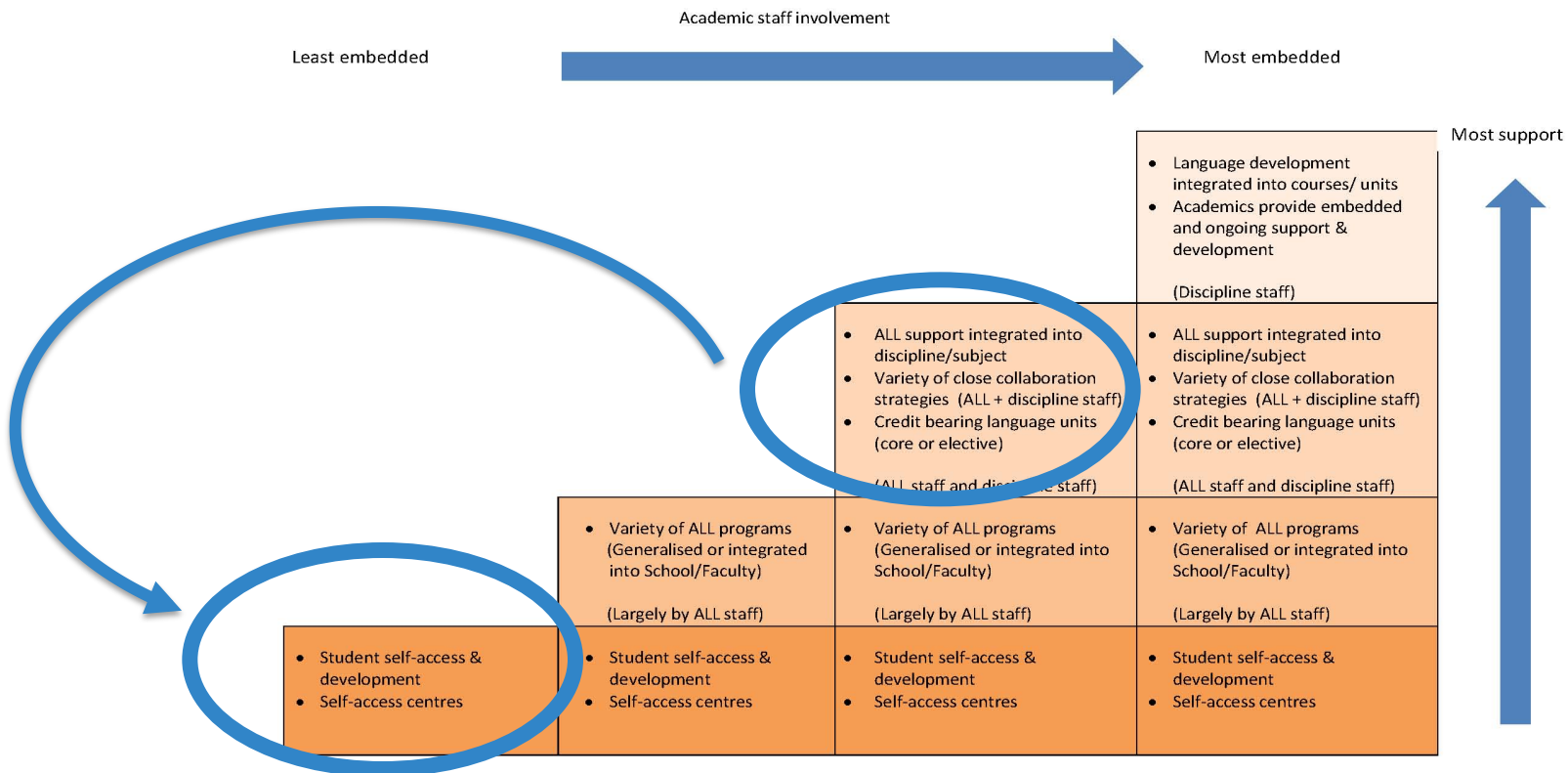
Selection Criteria	2014	Selection Criteria	2014
Communication skills	48.6%	Relevant qualifications	14.0%
Academic results	24.3%	Willingness to learn	12.1%
Teamwork skills	22.4%	Problem solving skills	11.2%
Aptitude	21.5%	Passion	10.3%
Interpersonal skills	20.6%	Customer service	8.4%
Leadership skills	19.6%	Analytical skills	6.5%
Work experience	19.6%	Technical skills	6.5%
Cultural fit	18.7%	Integrity	3.7%
Motivational fit	17.8%	Organised	3.7%
Adaptable	14.0%	Extra-curricular activities	3.7%

<sup>6</sup> Please note that because employers could nominate more than one selection criterion, the percentages in this table do not add up to 100 per cent.

# Embedding communication into curricula: a continuum

## A multi-layered model of language development provision (MMLDP)

### EMBEDDED LANGUAGE DEVELOPMENT AND SUPPORT CONTINUUM



.. all of the strategies in the MMLDP ..... may be viewed as elements of 'embedded' support that need to be maintained, while aiming for a model of 'fully embedded' support.

Briguglio & Watson (2014). 67-73.



# Towards a holistic, institution wide approach to curriculum enrichment

## Third generation approach: Transition pedagogy (Kift 2009)

‘A third generation FYE [First year experience] approach is a further collaborative and strategic leap again that requires whole-of-institution transformation. This optimal approach will only occur when first generation co-curricular and second generation curricular approaches are brought together in a comprehensive, integrated, and coordinated strategy that delivers a seamless FYE across an entire institution and all of its disciplines, programs, and services. **Third generation strategies will require an institutional vision for the FYE that is shared by academic and professional staff [for example ALL staff] who form sustainable partnerships across institutional boundaries to ensure its enactment.**’ (p. 1)

# A sustainable approach across learning environments

(Kift 2015)

- ‘The locus of a successful and **sustaining** FYE must be the **curriculum and its framing of student learning and engagement**. It is beyond question now also that, to deliver the necessary FYE quantum leap, we must move away from disparate, one-off initiatives and isolated examples of good practice. They are unsustainable and usually not scalable; staff are demoralised on their inevitable demise; and student success is left to chance by virtue of their *ad hoc*, incoherent deployment’. (p68)
- ‘In all of their diversity, with their multiple identities and changing patterns of engagement, **the curriculum is what all students have in common**. It is within our institutional control and is the one assured engagement we have with them all’. (p68)
- ‘From the institutional leadership perspective, the integrative possibilities of facilitating **sustainable, cross-institutional partnerships for the betterment of student satisfaction, learning and success, are compelling**’. (p64)

# Towards principles for a digital pedagogy for academic literacy

Aspects for consideration	Principles	Limitations
Institution	whole of institution, sustainable	budget, blended, online learning as budget saving
Pedagogy	team approach, teaching as potential learning design, community of practice	challenge of cross- institutional work
Technology	media and modes for pedagogical purposes	technology not pedagogy as driver
Users	value student experience, student learning pathways and student knowledge building (3 Rs rich, realistic and relevant online learning programs)	student voice can be 'uncertain and conservative' (Goodyear and Ellis 2010 p.108)
Learning	formative assessment, possible new ways to assess	summative assessment, accountability
Cycle of innovation	openness to change and innovation learning purpose suited to context	budget

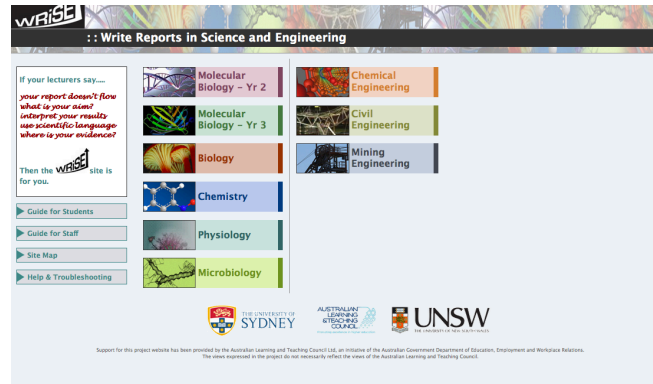
## What our year 12 students say about learning online

- ‘You can learn on your own, by yourself’
- ‘You can follow your own interests and this is sometimes more engaging’
- ‘If you teach it to yourself, you are generally more interested in the outcome and the subject’
- ‘You are then proud of yourself and your work’
- ‘Work at your own pace and use what you need’
- ‘It can accommodate your individual needs, it has a one on one feel’
- ‘In the classroom teachers don’t have time for everyone’s questions, I can go onto Google and find a website to answer my question’
- ‘Interactivity and visuals help, good colours and easy layout, if there is text, make it easy to read (headings etc.) and quick’
- ‘You can ask your friends in the classroom but you also message them when you get stuck online’

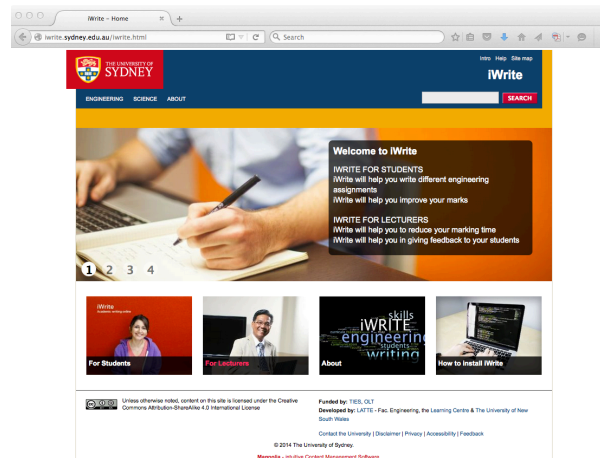
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# Thankyou



WRiSE <http://www.usyd.edu.au/learningcentre/wrise/>



iWrite <http://iwrite.sydney.edu.au/iwrite.html>